

Tomomi KATOH et al., S.N. 10/549,791
Page 2

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Dkt. 2271/75134

Listing of Claims

SEP 10 2007

The following listing of claims will replace all prior versions, and listings, of claims in the subject application:

Claim 1 (currently amended): An image reproducing and forming apparatus comprising:

an ejection head configured to eject a liquid droplet from a nozzle to form an image on a medium;

a driving signal generating unit configured to generate a driving signal having a waveform that causes the ejection head to operate at a driving frequency other than the natural frequency of the ejection head includes an ejecting pulse for causing the liquid droplet to be ejected from the nozzle and another pulse, and to select a desired waveform from the driving waveform to produce a driving signal, the driving signal generating unit being further configured to produce a non-ejecting pulse making use of different portions of the driving waveform, the non-ejecting pulse having a pulse width greater than that of the ejecting pulse, while producing energy for not ejecting the droplet; and

a driving unit configured to drive the ejection head based on the driving signal supplied from the driving signal generating unit.

Claim 2 (currently amended): The image reproducing and forming apparatus of claim 1, wherein the driving waveform includes first and second dummy pulses, and the driving signal generating unit produces the driving signal including a non-ejecting pulse that produces energy for not ejecting the droplet, and the driving unit applies the non-ejecting

Tomomi KATOH et al., S.N. 10/549,791
Page 3

Dkt. 2271/75134

~~pulse to the ejection head in a non-printing range in order to drive the ejection head at the driving frequency other than the natural frequency of the ejection head, making use of a portion of the first dummy pulse and a portion of the second dummy pulse.~~

Claim 3 (currently amended): The image reproducing and forming apparatus of claim [[2]] 1, wherein the driving waveform includes a dummy pulse and the driving signal generating unit produces the non-ejecting pulse, making use of a portion of the dummy pulse and a portion of the non-ejecting pulse of the driving signal.

Claim 4 (currently amended): The image reproducing and forming apparatus of claim [[2]] 1, wherein the driving signal generating unit produces the non-ejecting pulse that draws in a meniscus of the nozzle.

Claim 5 (currently amended): The image reproducing and forming apparatus of claim [[2]] 1, wherein signal generating unit produces the non-ejecting pulse that pushes out a meniscus of the nozzle and has a pulse width smaller than a period of pressure-induced resonance in a liquid chamber of the ejection head.

Claim 6 (currently amended): The image reproducing and forming apparatus of claim [[2]] 1, wherein the non-ejecting pulse has a falling edge with a first rate of voltage change and a rising edge with a second rate of voltage change that is smaller than the first rate of voltage change.

Tomomi KATOH et al., S.N. 10/549,791
Page 4

Dkt. 2271/75134

Claim 7 (currently amended): The image reproducing and forming apparatus of claim [[2]] 1, wherein the non-ejecting pulse includes a first portion that draws in a meniscus of the nozzle with a first rate of voltage change and a second portion that restores the meniscus of the nozzle with a second rate of voltage change smaller than the first rate of voltage change.

Claim 8 (currently amended): The image reproducing and forming apparatus of claim [[2]] 1, wherein the non-ejecting pulse includes a first waveform that pushes out a meniscus of the nozzle and a second waveform that follows the first waveform to draw in the meniscus of the nozzle, the first waveform having a pulse width smaller than a resonant frequency of a liquid chamber of the ejection head.

Claim 9 (currently amended): The image reproducing and forming apparatus of claim [[2]] 1, wherein the driving signal includes a first non-ejecting signal inserted at a beginning of the driving signal and a second non-ejecting signal inserted at an end of the driving signal.

Claim 10 (currently amended): The image reproducing and forming apparatus of claim [[2]] 1, wherein the ejection head includes an actuator for producing a pressure to eject the droplet, and the driving signal including the non-ejecting pulse is applied to the actuator.